



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/500,802

07/15/2005

Masayuki Ojima

1064

8371

27649

7590

08/04/2008

MICHAEL TOBIAS

1629 K ST NW

SUITE 300

WASHINGTON, DC 20006

EXAMINER

GAMINO, CARLOS J

ART UNIT

PAPER NUMBER

4162

MAIL DATE

DELIVERY MODE

08/04/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/500,802	<b>Applicant(s)</b> OJIMA ET AL.	
	<b>Examiner</b> CARLOS GAMINO	<b>Art Unit</b> 4162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 9-23 is/are pending in the application.
- 4a) Of the above claim(s) 21-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/16/08 &amp; 07/15/05</u> .                                 | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Group I, claims 9-20, in the reply filed on 06/30/08 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Specification***

2. The abstract of the disclosure is objected to because it is more than one paragraph. Correction is required. See MPEP § 608.01(b).

3. The disclosure is objected to because of the following informalities: the meaning of the word "charge" throughout the spec is unclear. On page 3, lines 26-29, the sentence contained within is awkward and the meaning of it can not be fully understood.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 9-10, 14-16 and 20** rejected under 35 U.S.C. 102(b) as being anticipated by applicant's admitted prior art (AAPA). Applicant states that flow soldering and wave soldering are known in the art and that they connect parts to printed circuit boards; page 1, lines 12-25. "...it is known to add P to a solder bath. [The] supply of P to a solder bath used a deoxidizing alloy having a much higher concentration of P..."; page 3, lines 6-8. "...when the solder alloy forming the solder bath already contained P, it was thought that the same solder alloy could be used as a solder alloy for replenishing."; page 4, lines 1-3. "...when an oxidation suppressing element in a solder bath is consumed, a method of coping was employed in which an amount corresponding to the consumed oxidation suppressing element was supplied... a mother alloy adjusted to have a high concentration of an oxidation suppressing element was supplied to a solder bath periodically, such as every day or 2-4 times per month, and the concentration of an oxidation suppressing element in the bath was adjusted."; page 4, lines 11-15.

6. Regarding claim 9, AAPA adds a solder alloy with P to the solder bath at a higher concentration than the bath.

7. Regarding claim 10, when the same solder alloy is used to refill the bath as was originally placed in the bath it is inherent that the bath will have a lower concentration of the oxidation suppressing element (OSE) than the added solder alloy because the OSE will have been consumed in the dross which is removed from the bath reducing its concentration.

8. Regarding claims 14 and 15, AAPA states that these are known methods of soldering.

9. Regarding claim 16, AAPA states that it known to use P as an OSE.
- 10.** Regarding claim 20, AAPA states that the amount of OSE that is consumed is replaced at the rate of everyday or 2-4 times a month.

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA as applied to claim 9 above, and further in view of Nishimura et al. (WO 01/62433 A1).

13. What AAPA does not teach is the replenishment solder alloy having the same composition as the solder bath except for the concentration of OSE and Cu.

14. '433 teaches that the amount of Cu in the replenishing alloy, which is the same as the bath except for the Cu, is controlled because of the leeching effect of Cu from the workpieces to the bath. It is also taught that Ag, Bi, In, P, or Ge may be added to the replenishing alloy to replenish these elements; abstract, page 1, page 3, lines 24-26, lines 11-25, page 5, lines 1-8, and page 8, lines 10-12. It would have been obvious to one of ordinary skill in the art at the time of the invention to have controlled the Cu, as did '433, to prevent leaching and to have controlled the OSE, as known in APPA, to help with removing oxides by altering the composition of these elements in the replenishing solder alloy as also taught by '433 because this method keeps the properties of the solder bath at a desired level.

15. **Claims 12 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA as applied to claim 9 above. As stated above AAPA states that the OSE in the bath is replenished by the amount consumed, thus replenishing it to a "target concentration".

16. What AAPA does not teach is the replenishment solder alloy having an OSE concentration of 2-6 times the target concentration of the OSE in the bath and the target concentration of the bath is the OSE concentration before soldering.

17. Regarding claim 12, the 2-6 times limitation is totally dependent upon the how much soldering is being done and how often the bath is replenished. AAPA states that the replenishing is done everyday or 2-4 times a month. It is the examiner's position that the 2-6 times limitation is subjective to frequency with which the alloy is added to the bath and that the AAPA would meet his limitation because it would have been obvious to one of ordinary skill in the art at the time of the invention to replenish the bath with OSE before the level became too low and adversely affected the soldering process.

18. Regarding claim 13, AAPA states that the OSE concentration of the bath is replenished by the amount consumed meaning that it is replenished to the level before soldering. It would have been obvious to one of ordinary skill in the art at the time of the invention that the target concentration would be the OSE concentration before soldering because this is the level at which the detrimental affects of oxygen are kept at bay.

19. **Claims 17-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA as applied to claim 9 above, and further in view of Steen et al. (WO 01/03878 A1) and Kim (KR 2001107354 A).

20. What AAPA does not teach is a replenishment solder alloy comprising a composition in mass % of AG: 2.5-3.5%, Cu: 0.2-0.9%, 60-100 ppm by mass of P (0.006-.01%) and the remainder Sn.

21. '878 teaches a solder alloy comprising used in wave soldering comprising a composition in wt% (same as mass %) of Sn to which is/are added one or more of Ag in an amount of up to 10% Cu in an amount of up to 5%~ Sb in an amount of up to 10% and Bi in an amount of up to 10%, which alloy additionally contains phosphorus in an amount of up to 0.01%. The P reduces the amount of oxide and dross formed; abstract and page 1, lines 21-22.

22. '354 teaches a solder alloy comprising a composition in wt% of , 0.1-7.0% Cu, 0.5-5.0% Ag, 0.0001-3.0% P and the remainder Sn. The P blocks the air from reacting with the liquid solder; abstract.

23. Both solder alloys listed above read on the claimed alloy and it would have been obvious to one of ordinary skill in the art at the time of the invention to have used either solder composition to in a wave soldering method to prevent the metals in the solder bath from forming oxides.

### ***Conclusion***

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- US 2005/0005736 teaches increasing the effectiveness of P.
- US 7,338,567 teaches a solder alloy.
- US 7,282,175 teaches a solder alloy.

- US 7,148,426 teaches a solder alloy matching the claimed composition.
- US 6,699,306 teaches controlling the Cu in a solder bath.
- US 6,517,602 teaches a solder alloy matching the claimed composition.
- US 6,475,643 teaches using P to suppress oxides in a solder bath.
- US 6,474,537 teaches a solder alloy.
- JP 2004066305 teaches a solder alloy matching the claimed composition.
- JP 2002336988 teaches a solder alloy.
- 

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CARLOS GAMINO whose telephone number is (571) 270-5826. The examiner can normally be reached on Monday-Thursday, 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer C. McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 4162

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CG

/Jennifer McNeil/  
Supervisory Patent Examiner, Art Unit 4162